CLAIMS:

1. A method of inhibiting erosion of an interior surface of a process vessel by solid objects whirled around in an annular zone against the interior surface of the process vessel by a fluid passing over the interior surface, the method including providing at least one formation in said annular zone to trap the whirling solid objects.

2. A method as claimed in Claim 1, which includes providing a plurality of circumferentially spaced formations in said annular zone in a plane angularly displaced relative to the direction of travel of the fluid.

3. A method as claimed in Claim 2, in which the fluid travels vertically and the formations are provided in a horizontal plane, and in which the formations are equidistantly spaced.

4. A method as claimed in Claim 2, in which the objects are trapped in bays or pockets defined between pairs of formations.

5. A method as claimed in Claim 2, in which the objects are trapped in bays or pockets defined between each formation and the interior surface of the vessel.

6. A method of inhibiting erosion of an interior refractory surface of a reformer for producing synthesis gas, by solid objects whirled around in an annular zone against the interior refractory surface by a gas stream passing over the interior refractory surface, the method including providing at least one formation at or in close proximity to the refractory surface in the path of the whirling solid objects to trap the whirling solid objects.

7. A method as claimed in Claim 6, in which a plurality of formations are provided, the objects being trapped in bays or pockets defined between pairs of formations or between each formation and the interior refractory surface, as the case may be.

8. A method as claimed in Claim 6, in which the reformer includes a catalyst bed with retaining means, in the form of a generally horizontally extending tile or brick layer configured to allow gas to pass downwardly through the tile or brick layer, on the catalyst bed for retaining the catalyst bed in position in the face of high gas velocities in the reformer, the method including providing a plurality of formations at or in close proximity to the interior refractory surface and above an upper surface of the tile or brick layer.

9. A method as claimed in Claim 8, in which the formations are located in an annular band or zone extending from the upper surface of the tile or brick layer to about 30cm above the upper surface of the tile or brick layer.

10. A method as claimed in Claim 8, in which providing a plurality of formations includes placing a plurality of tiles or bricks, each having an increased depth or thickness compared to other tiles or bricks in the layer of tiles or bricks, at spaced peripheral positions in the layer of tiles or bricks, adjacent the interior refractory surface, to project above the upper surface of the tile or brick layer.

11. A process vessel which includes

a body defining an interior vessel surface;

a catalyst bed in the body;

retaining means on the catalyst bed for retaining the catalyst bed in position; and

at least one formation at or in close proximity to the interior vessel surface above the retaining means for trapping solid objects whirled around in an annular zone above the retaining means by a fluid passing through the vessel, which

whirling solid objects can erode the interior vessel surface above the retaining means.

12. A vessel as claimed in Claim 11, in which the retaining means includes a generally horizontally extending layer of tiles or bricks laid on top of the catalyst bed, the layer of tiles or bricks allowing fluid to pass downwardly through the layer, the vessel including a plurality of spaced formations for trapping the whirling solid objects above the layer of tiles or bricks, each formation being defined by a tile or brick in the layer having an increased depth or thickness compared to the depth or thickness of other tiles or bricks in the layer and thus projecting above the other tiles or bricks in the layer.

13. A vessel as claimed in Claim 12, in which the tiles or bricks of increased depth or thickness are located at circumferentially equidistantly spaced peripheral positions in the layer of tiles or bricks.

14. A vessel as claimed in Claim 12, in which some of the tiles or bricks are regular hexagonal in plan view, some are trapezoidal and half of a regular hexagon in plan view, and some are pentagonal shaped in plan view, allowing the tiles or bricks to be laid out next to one another in abutting side by side relationship in a horizontal plane to form a roughly hexagonal plane figure in outline in plan view having extremities which fall on the outline of a hexagon and a circle.

15. A vessel as claimed in Claim 12, in which at least some of the bricks or tiles include a plurality of passages extending therethrough between an opening in a top surface and an opening in a bottom surface of each of said some bricks or tiles, at least 15% of a top surface area of each apertured brick or tile being occupied by the openings of the passages.

16. A vessel as claimed in Claim 15, in which the percentage of the top surface area of each apertured brick or tile occupied by the openings is at least 20%, at least some centrally located bricks or tiles having no passages.

17. A vessel as claimed in Claim 12, in which a ratio between the depth or thickness of the bricks or tiles having an increased depth or thickness to the depth or thickness of the other bricks or tiles in the layer is between 1,5:1 and 2:1.

18. A method of converting a reformer for production of synthesis gas having a catalyst bed but no open flame reaction zone above the catalyst bed, to a reformer having a catalyst bed and an open flame reaction zone above the catalyst bed, the method including providing at least one formation at or in close proximity to an interior refractory surface of the reformer at an elevation at which erosion of the refractory surface of the converted reformer due to gas-borne whirling solid objects travelling in an annular zone is expected, the formation acting to trap the whirling solid objects.

19. A method as claimed in Claim 18, in which the reformer includes retaining means on the catalyst bed for retaining the catalyst bed in position, the formation being provided so that it traps solid objects expected to be whirling in an annular path above the retaining means.

20. A method as claimed in Claim 19, in which the retaining means includes a layer of bricks or tiles laid on top of the catalyst bed, the method including replacing at least some of the existing bricks or tiles in the layer with replacement bricks or tiles which are larger in plan view and/or which are heavier, compared to the existing bricks or tiles in the layer.

21. A method as claimed in Claim 20, which includes providing a plurality of formations at or in close proximity to the interior refractory surface of the

reformer at the elevation at which erosion of the refractory surface due to gas-borne solid objects is expected, each formation being defined by a brick or tile in the layer having an increased depth or thickness compared to the depth or thickness of other tiles or bricks in the layer.

22. A method as claimed in Claim 21, in which the tiles or bricks of increased depth or thickness are located at circumferentially equidistantly spaced peripheral positions in the layer of tiles or bricks.

23. A method as claimed in Claim 21, in which all of the existing bricks or tiles in the layer are replaced with replacement bricks or tiles, some of the replacement bricks or tiles being regular hexagonal in plan view, some of the replacement bricks or tiles being trapezoidal and half of a regular hexagon in plan view, and some of the replacement bricks or tiles being pentagonal shaped in plan view, allowing the replacement bricks or tiles to be laid out next to one another in abutting side by side relationship in a horizontal plane to form a roughly hexagonal plane figure in outline in plan view having extremities which fall on the outline of a hexagon and a circle.

24. A method as claimed in Claim 23, in which at least some of the bricks or tiles include a plurality of passages extending therethrough between an opening in a top surface and an opening in a bottom surface of each of said some bricks or tiles, at least 15% of a top surface area of each apertured brick or tile being occupied by the openings of the passages.

25. A method as claimed in Claim 24, in which the percentage of the top surface area of each apertured brick or tile occupied by the openings is at least 20%, at least some centrally located bricks or tiles having no passages.

26. A method as claimed in Claim 21, in which a ratio between the depth or thickness of the bricks or tiles having an increased depth or thickness to the

depth or thickness of the other bricks or tiles in the layer is between 1,5:1 and 2:1.

27. A method as claimed in Claim 21, in which a ratio between a nominal diameter and the thickness or depth of each replacement brick or tile of standard depth is between 4:1 and 1:1.

28. A method as claimed in Claim 27, in which the ratio between the nominal diameter and the thickness or depth of each replacement brick or tile of standard depth is between 3:1 and 2:1.